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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/235,062	01/20/1999	JEFFREY L. SCHIFFER	42390.P6280	5229

7590

04/23/2002

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EXAMINER

GREEN, MIGUEL D

ART UNIT

PAPER NUMBER

2681

DATE MAILED: 04/23/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/235,062

Applicant(s)

SCHIFFER, JEFFREY L.

Examiner

Miguel D. Green

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,3-6,8-15,18 and 19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-6,8-15,18 and 19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 102***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. Claims 1, 3-5, 8, 9, 11-15, 18 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Ogino et al (US 5,668,563).
2. Regarding claims 1 and 4, Ogino et al teaches an apparatus comprising an intentional radiator including an antenna (42) and ground plane (41) to be coupled to shielding (the housing case 31 & 32, also comprised in the apparatus) that includes an opening (49) for the antenna, which is to be positioned such that the antenna radiates through the opening and the ground plane at least partially physically block emissions through the opening; note Fig. 3.
3. Ogino teaches an electrical connection (or in other equivalent words, the coupling between shielding, i.e., the housing case, and the ground plane) as a direct solder connection, in that the multilayered substrate (33), which reads to be a surface of the ground plane, is soldered to the upper case (31) in order to establish a ground with the housing (col.7 lines 30-37).
4. Regarding claims 3 and 5, Ogino et al teaches the apparatus as above further wherein the intentional radiator comprises a multilayer substrate (33) that reads on a printed circuit board

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with antenna radiating layer (36) and ground layer (41), first and second layers respectively disposed therein; note col.6, lines 1-18.

5. Regarding claim 8, Ogino et al teaches the apparatus as above wherein the intentional radiator comprises a frequency conversion circuit (45) that reads on a radio frequency module.

6. Regarding claim 9, Ogino et al teaches a system (GPS antenna 30) comprising an intentional radiator including an antenna (42) and ground plane (41) and a frequency conversion circuit (45) that reads on a device to be shielded, and shielding (housing case 31 & 32) enclosing the device to be shielded except for an opening (49), the shielding being coupled to the ground plane (note col.6, lines 64-66), the ground plane being oriented to at least partially physically block emissions through the opening; note Fig.3.

7. Ogino teaches an electrical connection (or in other equivalent words, the coupling between shielding, i.e., the housing case, and the ground plane) as a direct solder connection, in that the multilayered substrate (33), which reads to be a surface of the ground plane, is soldered to the upper case (31) in order to establish a ground with the housing (col.7 lines 30-37).

8. Regarding claim 11, Ogino et al teaches the system as above in re claim 9, further wherein the device to be shielded is integrated with the intentional radiator; note Fig.3.

9. Regarding claim 12, Ogino et al teaches the system as above further wherein the intentional radiator includes a multilayer substrate (33) that reads on a printed circuit board with antenna radiating layer (36) and ground layer (41), first and second layers respectively disposed therein; note col.6, lines 1-18.

10. Regarding claim 13, Ogino et al teaches the system as above wherein the intentional radiator comprises a frequency conversion circuit (45) that reads on a radio frequency module.

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11. Regarding claims 14&15, Ogino et al teaches the method(s) for integrating components, positioning the antenna through an opening, coupling shielding to ground via electrical (soldering is implied as a typical means) and/or mechanical connection, and orienting the ground plane such that it at least partially physically blocks emissions through the opening in the construction of the structural apparatus and integrated system as described above; note col.6, line 19 – col.7, line 59.

12. Ogino teaches an electrical connection (or in other equivalent words, the coupling between shielding, i.e., the housing case, and the ground plane) as a direct solder connection, in that the multilayered substrate (33), which reads to be a surface of the ground plane, is soldered to the upper case (31) in order to establish a ground with the housing (col.7 lines 30-37).

13. Regarding claims 18&19, Ogino et al teaches an apparatus comprising a means for shielding (i.e., housing case coupled to ground plane) including an opening for an antenna and a means for coupling the shielding to the ground plane that is oriented to at least partially physically block emissions through the opening, wherein the means for shielding comprising one of a metallic paint or a metallic enclosure and the coupling means comprises one of a mechanical connector or a soldered connection (i.e., the through-holes and copper etching); note col.6, line 61 – col.7, line 4.

14. Ogino teaches an electrical connection (or in other equivalent words, the coupling between shielding, i.e., the housing case, and the ground plane) as a direct solder connection, in that the multilayered substrate (33), which reads to be a surface of the ground plane, is soldered to the upper case (31) in order to establish a ground with the housing (col.7 lines 30-37).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 1, 3-6, 8-15, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nichols et al (US 5,691,726) in view of Mitchell (US 4,605,471).

16. Regarding claims 1 and 4, Nichols et al teaches an apparatus (GPS/radio antenna 10) comprising an intentional radiator including an antenna (30) and ground plane (electrically in contact with ground layer 36) to be coupled to shielding (also comprised as 62 & 74) that includes an opening (40) for the antenna, which is to be positioned such that the antenna radiates through the opening and the ground plane at least partially physically block emissions through the opening; note Figs.2b & 3 and col.4, lines 10-21 & 41-50 and col.4, line 66 – col.5, line 35.

17. Nichols teaches an electrical connection (or in other equivalent words, a coupling) between shielding and the ground plane, as in how the shielding (base 62) and the ground plane (layer 36) are connected with vias to form an electrically isolated enclosure (col.4 line 66 – col.5 line 6). Nichols does not disclose the ground plane (or any surface portion thereof) directly soldered to the shielding. However, when using vias in modern surface mount technology, a metallic connection facilitated by the via is needed to selectively connect one printed circuit board (PCB) layer to another. Case in point: a PCB with multiple layers needs a via to connect

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the top surface layer where circuit components are mounted to a ground layer that may be positioned below a power layer, in which case a metal connection at the via must be made to contact the ground layer but not the power layer through which it must pass; likewise, in other places, the metal connection must instead be made to the power layer without "shorting" electrical pathways to ground. Mitchell provides evidence of this practice of using metallic soldering to provide an electrical connection between ground plane and shielding (col.5 lines 43-51 and Fig.1E); herein, the connection is direct in the sense that soldering plates the via (within itself) to seal an electrical connection for precisely contacting appropriate layers; moreover, the via is considered electrically to be a portion (i.e., extension) of either the ground plane or the shielding (or even both), and further as such, metallic solder contact by virtue of a via reads on a direct solder connection. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a direct solder connection, by virtue of metallic plating a via pathway with solder as taught by Mitchell, since soldering provides a strong, stable connection as a good engineering practice for connecting different layers of a PCB. Furthermore, metal soldering at a via is a way to make electrical connection favorable more than other espoused alternatives (such as a wrap around wire connection), because it takes up less PCB "real estate", which is highly valued, and does not use excess material which is costly.

18. Regarding claims 3 and 5, Nichols et al teaches the apparatus as above further wherein the intentional radiator comprises a printed circuit board (56) with antenna radiating layer (34) and ground layer (36), first and second layers respectively disposed therein; note Fig. 2b and col.4, lines 10-21 & 48-50.

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19. Regarding claim 6, Nichols et al teaches the apparatus as above to further include a plastic radome (60) that is a skin covering; note Fig.3.
20. Regarding claim 8, Nichols et al teaches the apparatus as above wherein the intentional radiator comprises a radio frequency module, i.e., electrical the preamplifier (16) and diplexer (18) components together forming the RF module; note Fig.3.
21. Regarding claim 9, Nichols et al teaches a system (50) comprising an intentional radiator including an antenna (30) and ground plane (note col.4, lines 49-50) and a device to be shielded, wherein a device is read as any one of the plurality of electrical components (52), and shielding (62 and 74) enclosing the device to be shielded except for an opening (40), the shielding being coupled to the ground plane (note col.5, lines 30-33), the ground plane being oriented to at least partially physically block emissions through the opening; note Fig.3.
22. Furthermore, Nichols in view of Mitchell teaches a direct solder electrical connection as discussed in ¶17 above, not repeated here for sake of brevity.
23. Regarding claim 10, Nichols et al teaches the system as above to further include a plastic radome (60) that is a skin covering; note Fig.3.
24. Regarding claim 11, Nichols et al teaches the system as above in re claim 9, further wherein the device to be shielded is integrated with the intentional radiator; note Fig.3.
25. Regarding claim 12, Nichols et al teaches the system as above further wherein the intentional radiator includes a printed circuit board (56) with antenna radiating layer (34) and ground layer (36), first and second layers respectively disposed therein (Fig. 2b and col.4, lines 10-21 & 48-50).



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26. Regarding claim 13, Nichols et al teaches the system as above wherein the intentional radiator comprises a radio frequency module, i.e., electrical the preamplifier (16) and diplexer (18) components together forming the RF module; note Fig.3.

27. Regarding claims 14&15, the method(s) for integrating components, positioning the antenna through an opening, coupling shielding to ground via electrical (soldering is implied as a typical means) and/or mechanical connection, and orienting the ground plane such that it at least partially physically blocks emissions through the opening is suggested by Nichols et al (col.5, lines 4-8) in constructing the structural apparatus and integrated system as described above.

28. Furthermore, Nichols in view of Mitchell teaches a direct solder electrical connection as discussed in ¶17 above, not repeated here for sake of brevity.

29. Regarding claim 18, Nichols et al teaches an apparatus comprising a means for shielding including an opening for an antenna and a means for coupling the shielding to the ground plane that is oriented to at least partially physically block emissions through the opening (as in, the shielding enclosure and spaced vias or conductive material coupling recited in col.4, line 66 – col.5, line 4).

30. Furthermore, Nichols in view of Mitchell teaches a direct solder electrical connection as discussed in ¶17 above, not repeated here for sake of brevity.

31. Regarding claim 19, Nichols et al teaches the apparatus as above in re claim 18 wherein the shielding enclosure reads on the means for shielding comprising one of a metallic paint or a metallic enclosure, and the coupling means comprises one of a mechanical connector or a soldered connection; note col.4, line 66 – col.5, line 4 and col.5, lines 19-24.

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***Prior Art of Record***

The following is prior art made of record and not relied upon but considered pertinent to applicant's disclosure:

Kanda et al (US Pat. No. 5083132) teaches an apparatus comprising an intentional radiator (10) including an antenna (13 & 14) and a ground plane (12) to be coupled to shielding (inherently via casing 18 and connection 24 to coaxially input that has ground sheathing) that includes an opening (16) for the antenna, which is to be positioned such that the antenna radiates through the opening and the ground plane at least partially physically block emissions through the opening; note Figs.1-2.

Black (US Pat. No. 4170013) teaches an apparatus comprising an intentional radiator (10) including an antenna (17) and a ground plane (15) to be coupled to shielding (given the inherent function of another ground plane 14) that includes an opening (19) for the antenna, which is to be positioned such that the antenna radiates through the opening and the ground plane at least partially physically block emissions through the opening; note Fig.2B.

***Conclusion***

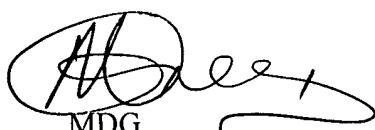
Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

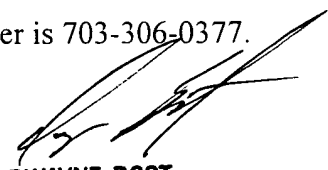
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Miguel D. Green whose telephone number is 703-308-6729. The examiner can normally be reached on Mon-Fri (9am - 5pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dwayne D. Bost can be reached on 703-305-4778. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to customer service personnel whose telephone number is 703-306-0377.

  
MDG  
April 19, 2002

  
DWAYNE BOST  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600